

Appl. N . 09/783,835

C, 53. A physical vapor deposition target comprising an alloy of copper and one or more other elements, the one or more other elements being present in the alloy at a total concentration from less than 1.0 at% to 0.001 at% and being selected from the group consisting of Mo, Tc, Re, and Tl.

54. The physical vapor deposition target of claim 53 wherein the one or more other elements are present in the alloy at a total concentration at from 0.005 at% to 0.1 at%.

55. The physical vapor deposition target of claim 53 comprising an RF sputtering coil.

60. The physical vapor deposition target of claim 53 wherein the element comprises Mo.

61. The physical vapor deposition target of claim 53 wherein the element comprises Tc.

62. The physical vapor deposition target of claim 53 wherein the element comprises Re.

63. The physical vapor deposition target of claim 53 wherein the element comprises Tl.

Appl. No. 09/783,835

64. (New) The physical vapor deposition target of claim 53 wherein the one or more other elements are present in the alloy as uniformly distributed fine precipitates in the alloy microstructure.

65. (New) The physical vapor deposition target of claim 53 wherein the average grain size is less than or equal to about 20 micrometers.

66. (New) A physical vapor deposition target comprising a copper alloy, the alloy consisting of copper having a purity of 99.9998% alloyed with a total concentration of other elements of from less than 1.0 at% to 0.001 at%, the other elements being selected from the group consisting of Tc, Ti, Re, and Mo.

67. (New) The physical vapor deposition target of claim 66 wherein the copper alloy comprises an average grain size and comprises an electromigration resistance higher than the electromigration resistance of copper having a purity of greater than 99.999% of the same average grain size.

68. (New) The physical vapor deposition target of claim 66 wherein the copper alloy comprises an average grain size and comprises a thermal stability to grain size retention that is higher than the thermal stability to grain size retention of copper having a purity of greater than 99.999% of the same average grain size.

Appl. N . 09/783,835

69. (New) The physical vapor deposition target of claim 66 comprising three or fewer of the other elements.

C1